

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously presented) A keypad device to be applied in an electrical device, wherein the keypad device comprises:

a keypad module including a plurality of keys and respective output pins of the keys, the keypad module being used for outputting an interrupt signal when at least one of the keys is pressed, and for outputting a parallel signal corresponding to the keys through the output pins when the keypad module receives a drive signal;

a parallel/serial conversion device coupled to the output pins of the keypad module for receiving the parallel signal and outputting a serial signal according to the parallel signal; and

a controller, coupled to the keypad module and the parallel/serial conversion device respectively, wherein the controller includes an input/output pin, coupled to the keypad module, for receiving the interrupt signal and outputting the drive voltage in response to the interrupt signal, and the controller receives the serial signal and determines the status of the keypad module according to the serial signal received;

wherein the controller, in response to the interrupt signal, sets the input/output pin as an output pin to output the drive voltage to the keypad module to enable the keypad module to output the parallel signal.

2. (Previously presented) The keypad device according to claim 1, wherein when the controller determines that no key of the keypad module is being pressed according to the serial signal received, the controller sets the input/output pin which is coupled to the keypad module as an input pin.

3. (Original) The keypad device according to claim 1, wherein the electrical device is a PDA (Personal Digital Assistant).

4. (Canceled)

5. (Previously presented) A keying input circuit, comprising:
a keypad module including a plurality of keys and a plurality of respective output pins for the keys, wherein when at least one of the keys is pressed, the keypad module outputs an interrupt signal and outputs module status data in parallel from the output pins, which includes a plurality of key status data corresponding to the keys;

a control circuit, electrically connected to the keypad module, for outputting a drive voltage and a clock signal in response to the interrupt signal;

a conversion circuit, being electrically connected to the keypad module and the control circuit respectively for receiving the key status data in parallel from the output pins of the keypad module according to the drive voltage and for serially outputting the key status data according to the timing of the clock signal; and

a recognition circuit, electrically connected to the conversion circuit, for serially receiving the key status data and recognizes which key is pressed according to the key status data.

6. (Original) The keying input circuit according to claim 5, wherein the control circuit and the recognition circuit are installed in a micro-controller.

7. (Original) The keying input circuit according to claim 5, wherein the interrupt signal is at a low-level voltage.

8. (Original) The keying input circuit according to claim 5, wherein the drive voltage is at a high-level voltage.

9. (Previously presented) The keying input circuit according to claim 5, wherein the module status data includes a plurality of bits of key status data which correspond to respective ones of the keys.

10. (Previously presented) A keypad detecting method used in a keypad input circuit, wherein the keypad input circuit includes at least a keypad module which includes a plurality of keys and respective output pins of the keys, a conversion circuit, and a microcontroller, the method comprising:

outputting an interrupt signal to the microcontroller from the keypad module when at least one of the keys is pressed;

in response to the interrupt signal, enabling the conversion circuit to receive module status data from the keypad module through the output pins in parallel, and enabling the conversion circuit to serially output the key status data, wherein the module status data includes key status data corresponding to the keys; and

serially receiving the key status data from the conversion circuit by the micro-controller and recognizing which key of the keys is pressed according to the key status data by the micro-controller.

11. (Previously presented) The keypad device according to claim 1, wherein the keypad module further includes a first pin coupled to the input/output pin of the controller, and when at least one of the keys is pressed, the keypad module outputs the interrupt signal to the controller through the first pin.

12. (Previously presented) The keypad device according to claim 11, wherein the controller sets the input/output pin as an input pin so that the controller receives the interrupt signal from the keypad module when at least one of the keys is pressed.